

DATA EVALUATION RECORD
CHRONIC TOXICITY TEST WITH THE HONEY BEE
Non-Guideline Chronic Feeding Study

- 1. CHEMICAL:** Dicamba **PC Code:** 029801

2. TEST MATERIAL: BAS 183 H (Dicamba acid) **Purity:** 93.9 ± 1.0%

3. CITATION

Author: Saskia Ruhland

Title: Chronic toxicity of BAS 183 H to the honey bee *Apis mellifera L.* under laboratory conditions

Study Completion Date: October 1, 2018

Laboratory: BioChem agrar

Sponsors: BASF SE
67056 Ludwigshafen Germany

Laboratory Report ID: 821830

DP Barcode: 451249

MRID: 50784603

4. REVIEWED BY: Julie Burns, Environmental Scientist, CDM/CSS-Dynamac JV

Signature:

Julie Burns)

Date: 5/28/2019

APPROVED BY: Environmental Scientist, CDM/CSS-Dynamac JV

Signature:

Monroe V Wright

Date: 6/21/2019

5. REVIEWED BY: Michael Wagman, Senior Scientist, OPP/EFED/ERB2

Signature:

MICHAEL
WAGMAN

Digitally signed by
MICHAEL WAGMAN
Date: 2020.10.23 12:26:22
-04'00'

Date: 10/23/2020

REVIEWED BY: Michael Lowit, Ph.D., Senior Scientist, OPP/EFED/ERB6

Signature:

Michael Lowry

Date: 10/23/2020

6. DISCLAIMER

This Data Evaluation Record may have been altered by the Environmental Fate and Effects Division subsequent to signing by CDM/CSS-Dynamac JV personnel. The CDM/CSS-Dynamac Joint Venture role does not include establishing Agency policies.

7. STUDY PARAMETERS

Test Species: *Apis mellifera* L.

Age of Test Organisms at Test Initiation: ≤ 2 days

Exposure Duration: 10 days

8. CONCLUSIONS

The honey bee, *Apis mellifera*, was exposed to BAS 183 H (Dicamba) for 10 days in a feeding study at the nominal and measured concentrations/actual intake dietary doses shown in the tables below. The lowest and highest measured concentrations/doses were calculated by the reviewer by applying the corresponding recoveries of the lowest (92%) and highest (91%) test level from the analytical data (Day 0 and Day 9 measurements). For the remaining doses/concentrations, the reviewer averaged the lowest and highest recovery and applied that mean recovery (91.5%) to obtain the measured concentrations/doses.

Nominal Concentration (mg ai/kg diet)	Mean-Measured Concentration (mg ai/kg diet)	Nominal Dietary Dose (μg ai/bee/day)	Nominal Actual Intake Dietary Dose (μg ai/bee/day)	Measured Actual Intake Dietary Dose (μg ai/bee/day)
161.1	149.1	6.27	5.16	4.7
322	295	12.5	10.7	9.8
645	590	25.1	20.7	19
1289	1179	50.2	36.4	33
2578	2358	100	66.3	60

After 10 days, mortality averaged 0% in the negative control and 13% in the solvent control, as compared to mortality ranging from 3 to 13% in the groups exposed to the test material. Mortality in the positive control (Dimethoate) was 100% at ten days. No behavioral abnormalities were noted. Daily food consumption averaged 36.9 and 26.3 mg/bee/day in the negative and solvent controls, respectively, and averaged 32, 33.3, 32.1, 28.2, and 25.7 mg/bee/day in the measured 4.7, 9.8, 19, 33, and 60 μg ai/bee/day groups, respectively.

The mortality-based NOAEC and LC₅₀ were ≥2358 and >2358 mg ai/kg diet, respectively (corresponding to a NOAEL and LD₅₀ of ≥60 and >60 µg ai/bee/day, respectively). The food consumption based NOAEC and NOAEL values were 590 mg ai/kg diet and 19 µg ai/bee/day, respectively, based on 24% decreased food consumption at the LOAEC and LOAEL of 1179 mg ai/kg diet and 33 µg ai/bee/day, respectively, compared to the negative control.

The raw data show that volume of food consumption decreased as the concentrations/doses increased. It is possible that if food consumption were less affected, mortality would further increase. Aversion of food consumption due to the test material should be considered when assessing the mortality in this experiment.

It is important to note that there was a statistically significant ($p = 0.01$) reduction of food consumption in the solvent control compared to the negative control (41%). The mean food consumption in the solvent control group was also lower than all treatment groups (ranging from ca. 7% to 27%) except for the highest treatment group (60 µg ai/bee), which showed slightly lower mean food consumption than the solvent control (ca. 2%). Therefore, it is difficult to discern the extent that the observed effects on food consumption (compared to the negative control) in the highest two treatment groups may be attributable to exposure to the test material versus the solvent. Given this uncertainty, the reviewer considered the results from an independently conducted adult chronic oral study also conducted with dicamba acid (MRID 50931304). That study was a limit test (only a single tested dose of 64.8 µg ai/bee/day, equivalent to a concentration of 4200 mg ai/kg-diet) without a solvent control and like this study found no mortality and a statistically significant ($p < 0.01$) reduction in food consumption (44% compared to the negative control). The combined results of the two studies give greater confidence that the potential effects on food consumption in the current study are due to exposure to dicamba rather than the solvent control. Nonetheless, the food consumption results should be interpreted with caution.

Endpoint	Mortality	Food Consumption
Diet Concentration (mg ai/kg diet)	LC ₅₀ > 2358 95% CI: N/A Slope: N/A NOAEC ≥ 2358 LOAEC > 2358	IC ₅₀ > 2358 95% CI: N/A Slope: N/A NOAEC = 590 LOAEC = 1179
Dietary Dose (µg ai/bee/day)	LD ₅₀ > 60 95% CI: N/A Slope: N/A NOAEL ≥ 60 LOAEL > 60	ID ₅₀ > 60 95% CI: N/A Slope: N/A NOAEL = 19 LOAEL = 33

9. ADEQUACY OF THE STUDY

This study is scientifically sound and is classified as **Acceptable**.

10. GUIDELINE DEVIATIONS

This study was conducted following the proposed OECD Guideline for the Testing of Chemicals: Honey bees (*Apis mellifera* L.), chronic oral toxicity test (10 day feeding test in the laboratory).

The reviewer evaluated the study based on the final TG OECD 245 (2017).

One deviation was noted:

- The study author did not report if bees were randomly assigned to test groups.

This deviation does not impact the acceptability of this study.

11. SUBMISSION PURPOSE

This study was conducted for the purpose of re-registration.

12. MATERIALS AND METHODS

A. Test Organisms

Guideline Criteria	Reported Information
Species Honey Bee (<i>Apis mellifera</i> L.)	Honey bee (<i>Apis mellifera</i> L. subspecies Buckfast)
Age at beginning of test Worker bees of uniform age.	≤ 2-day old young worker bees
Source	Test facilities' own supply (Germany).
Were bees from diseased-free colonies?	Honey bees were from hives not exposed to chemical application (anti- <i>Varroa</i> treatments) for at least 1 month prior to testing. Colonies were healthy, disease free and queen-right.

Guideline Criteria	Reported Information
Were bees kept in conditions conforming to proper cultural practices?	<p>Bee colonies were held under field conditions according to good beekeeping practice. The hives had a healthy queen and brood in all stages (egg, larval, pupal). Food combs containing sufficient nectar and pollen were present.</p> <p>Frames were placed without adult worker bees in a five-comb hive body and incubated under controlled conditions in darkness prior to 24-hr acclimation.</p>
<u>Acclimation conditions</u>	<p>24 ± 2 hours prior to test start, newly hatched bees were transferred to test cages. Bees were acclimated to test conditions at 33 ± 2°C and 50-70% relative humidity. Bees were fed 50% (w/v) sucrose solution.</p>

B. Test System

Guideline Criteria	Reported Information
<u>Test Chambers</u>	<p>Aluminum cage (95 x 60 x 70mm) with holes in the lateral walls for ventilation and 2 glass plates for observations.</p>
<u>Temperature during exposure</u>	31.5-34.1°C
<u>Relative humidity during exposure</u>	54.0-66.0%
<u>Lighting</u>	<p>Constant darkness except during handling and assessments where diffuse artificial light was used.</p>
<u>Feeding</u>	<p>Bees were fed treated 50% sucrose solution in 5% acetone (exposed groups), untreated 50% sucrose solution (negative control), or untreated 50% sucrose solution in 5% acetone (solvent control). Bees were fed <i>ad libitum</i> with syringes that were renewed daily.</p>

C. Test Design

Guideline Criteria	Reported Information
<u>Test material</u>	<p>Identity: BAS 183 H Synonyms: Dicamba IUPAC name: 3,6-dichloro-2-methoxy-benzoic acid CAS No.: 1918-00-9 Batch ID: 0002B01BA-251 Purity: 93.9 ± 1.0 % Storage: Room temperature (+5°C to +35°C)</p>
<u>Nominal application rates</u> The test material should be applied at the maximum proposed label rate.	<p><u>Diet concentrations:</u> 0 (negative and solvent controls), 161.1, 322, 645, 1289, and 2578 mg ai/kg diet</p> <p><u>Actual intake dietary doses:</u> 0 (negative and solvent controls), 5.16, 10.7, 20.7, 36.4, and 66.3 µg ai/bee/day</p>
<u>Dose Preparation</u>	<p>Solutions were prepared daily just before the diet was administered. The test material (0.081 g) was added to acetone (1.25 mL), then brought to volume with 50% sucrose solution to prepare highest dose. Remaining doses were prepared using serial dilution.</p>
<u>Number of bees exposed</u>	<p>Each treatment (including untreated control, vehicle control, and toxic reference item) had 3 replicates, with 10 bees per replicate. 30 total bees per treatment application were exposed.</p>
<u>Application methods</u>	<p>The test sucrose feeding solutions were provided <i>ad libitum</i> with syringe feeders. Feeders were renewed every day. In order to reduce stress, retrieving and replacing syringes was done around the same time each day, as quickly as possible.</p> <p>Feeders were weighed before and after they were offered. The food consumed was determined by comparing the initial and remaining weights.</p>

Guideline Criteria	Reported Information
<u>Other experimental design information</u>	<p>Individual daily consumption was corrected for daily mortality and for estimated evaporation.</p> <p>Additional test cages with pre-weighed feeders containing diets of negative control and solvent control were set up with the main test cages but without bees. The feeders were exchanged and re-weighed daily to determine evaporative loss.</p> <p>Accumulation of pesticide vapor was prevented by the air conditioning equipment of the test room.</p>
<u>Were bees randomly or impartially assigned to test groups?</u>	Not reported.
<u>Controls</u>	Negative control: 50% aqueous sucrose solution Solvent Control: 50% aqueous sucrose solution + 5% acetone
<u>Exposure period</u>	10 days
<u>Positive Control</u>	Toxic reference item: Dimethoate (0.696 mg ai/kg diet)

13. REPORTED RESULTS

Guideline Criteria	Reported Information
<u>Quality assurance and GLP compliance statements were included in the report?</u>	Yes. This study was conducted in compliance with the EPA GLP Standards specified under FIFRA and as accepted by the OECD Principles of Good Laboratory Practice.
<u>Control mortality</u>	0% mortality was observed in the negative control, and 13% mortality was observed in the solvent control at test termination.
<u>Were raw data included?</u>	Yes

Guideline Criteria	Reported Information
Were signs of toxicity described?	Affected bees were observed daily at all treatment levels for abnormalities such as apathy, affected, cramps, vomiting, etc. No behavioral abnormalities were observed in any test concentration group.

Mortality and Observations

Measured Diet Concentrations, mg ai/kg diet (Actual Intake Doses, µg ai/bee/day)	Number Exposed	Mortality at 10 days (%)	Behavioral Abnormalities
Negative control	30	0	None
Solvent control	30	13	None
BAS 183 H (Dicamba)	149.1 (4.7)	30	13
	295 (9.8)	30	10
	590 (19)	30	7
	1179 (33)	30	3
	2358 (60)	30	7

After 10 days, mortality averaged 0% in the negative control and 13% in the solvent control, as compared to mortality ranging from 3 to 13% in the groups exposed to the test material. Mortality in the positive control (Dimethoate) was 100% at ten days.

Daily food consumption averaged 36.9 and 26.3 mg/bee/day in the negative and solvent controls, respectively, and averaged 32, 33.3, 32.1, 28.2, and 25.7 mg/bee/day in the measured 4.7, 9.8, 19, 33, and 60 µg ai/bee/day groups, respectively.

Study Author's Statistical Analysis

The solvent control and test item groups mortality data were compared using Fisher's Exact Binomial Test with Bonferroni Correction (one-sided greater, $\alpha=0.05$) in ToxRat Professional 3.2.1 for the 10-day mortality. The LD/LC₅₀ values were not calculated due to the low observed mortality. These values were reported as being higher than the highest nominal actual intake dose/nominal concentration. The study author did not statistically analyze food consumption data.

Statistical Value	Mortality	
NOAEC (mg ai/kg) / NOAEL (μg ai/bee/day)	2578	66.3
LOAEC (mg ai/kg) / LOAEL (μg ai/bee/day)	>2578	>66.3
LC ₅₀ (mg ai/kg) / LD ₅₀ (μg ai/bee/day)	>2578	>66.3

Reviewer's Statistical Verification

The reviewer analyzed mortality and mean daily food consumption using CETIS statistical software version 1.9.5.3 with database backend settings implemented by EFED on 7/25/17. The test codes were designated the MRID number, followed by the acronyms "dc" for dietary concentration and "dd" for dietary dose. The measured actual intake dietary doses and measured diet concentrations were used for the analyses.

The negative and solvent controls were analyzed using an Equal Variance t Two-Sample test. Control mortality was not significantly different, but food consumption was significantly ($p=0.01$) different (the solvent control was reduced by 29% as compared to the negative control). All subsequent test item data were compared to the negative control.

Data were tested for normality using Shapiro-Wilk's test ($\alpha = 0.01$) and for homogeneity of variance using Bartlett's or Levene's test ($\alpha = 0.01$). Mortality and food consumption data fit the normal distribution and were homoscedastic, and were subsequently analyzed using ANOVA and Williams' test.

Mortality showed little to no trend with increasing diet concentration/dose, and the highest mortality (13%) was observed in the solvent control and lowest treatment doses, so the LC₅₀/LD₅₀ values were empirically estimated to be greater than the highest measured concentration/dose. Furthermore, the NOAEC/L were judged to be greater than or equal to the highest test concentration. The reviewer attempted to extrapolate IC/ID₅₀ values for food consumption, but the values were unreasonably high and the 95% confidence limits were unreasonable indicating the extrapolated IC/ID₅₀ values were likely unreliable.

Endpoint	Mortality	Food Consumption
Diet Concentration (mg ai/kg diet)	LC ₅₀ > 2358 95% CI: N/A Slope: N/A NOAEC < 149.1 LOAEC ≤ 149.1	IC ₅₀ > 2358 95% CI: N/A Slope: N/A NOAEC = 590 LOAEC = 1179
Dietary Dose (μg ai/bee/day)	LD ₅₀ > 60 95% CI: N/A Slope: N/A NOAEL < 4.7 LOAEL ≤ 4.7	ID ₅₀ > 60 95% CI: N/A Slope: N/A NOAEL = 19 LOAEL = 33

14. REVIEWER'S COMMENTS

The reviewer's and study author's mortality-based NOAEC/NOAEL and LC/LD₅₀ values were in agreement when considering the differences between the measured diet concentrations/actual intake dietary doses (used by the reviewer) and the nominal diet concentrations/actual intake dietary doses (used by the study author). The reviewer determined the measured diet concentrations/actual intake dietary doses in the lowest and highest treatment groups using the corresponding recoveries of the lowest (92%) and highest (91%) test level from the analytical data (Day 0 and Day 9 measurements) and then took the mean recovery (91.5%) to determine the measured diet concentrations/actual intake dietary doses in the intermediary treatment groups. The study author did not analyze food consumption, which was an affected endpoint in this experiment. The reviewer's results are reported in the Conclusions sections of this DER.

The raw data show that volume of food consumption decreased as the concentrations/doses increased. It is possible that if food consumption were less affected, mortality would further increase. Aversion of food consumption due to the test material should be considered when assessing the mortality in this experiment.

It is important to note that there was a statistically significant ($p = 0.01$) reduction of food consumption in the solvent control compared to the negative control (41%). The mean food consumption in the solvent control group was also lower than all treatment groups (ranging from ca. 7% to 27%) except for the highest treatment group (60 μg ai/bee), which showed slightly lower mean food consumption than the solvent control (ca. 2%). Therefore, it is difficult to discern the extent that the observed effects on food consumption (compared to the negative control) in the highest two treatment groups may be attributable to exposure to the test material versus the solvent. Given this uncertainty, the reviewer considered the results from an independently conducted adult chronic oral study also conducted with dicamba acid (MRID 50931304). That study was a limit test (only a single tested dose of 64.8 μg ai/bee/day, equivalent to a concentration of 4200 mg ai/kg-diet) without a solvent control and like this study found no mortality and a statistically significant ($p < 0.01$) reduction in food consumption (44% compared to the negative control). The combined results of the two studies give greater

confidence that the potential effects on food consumption in the current study are due to exposure to dicamba rather than the solvent control. Nonetheless, the food consumption results should be interpreted with caution.

According to OECD Draft Guidance, the test was considered to be valid if:

1. The average control mortality was $\leq 15\%$ by test termination; and
2. The average reference item mortality was $\geq 50\%$ by test termination.

Both validity criteria were met.

The experimental portion of this study was conducted from July 10 to July 20, 2018.

15. REFERENCES

Abbott, W. S.: A method of computing the effectiveness of an insecticide. *J. Econ. Entomol.* 18, 265-267, 1925.

CEB (Commission des Essais Biologiques), Méthode d'évaluation des effets de toxicité aiguë et à court terme des préparations phytopharmaceutiques sur l'abeille domestique (*Apis mellifera* L.). Translation: AFPP Method No. 230, CEB 2012: Evaluation of effects of plant protection products on *Apis mellifera* L. (French Association for Plant Protection: Guideline for chronic toxicity testing, 2012)

Chemikaliengesetz in der Fassung der Bekanntmachung vom 28. August 2013 (BGBl. I S. 3498, 3991), das zuletzt durch Artikel 1 der Verordnung vom 22. Juni 2016 (BGBl. I S. 1479) geändert worden ist. Translation: Chemicals Act in the version published on 28 August 2013 (Federal Law Gazette I p. 3498, 3991), as last amended by article 1 of the Regulation of 22 June 2016 (Federal Law Gazette I p. 1479).

Decourtye, A. *et al.*: Learning performances of honeybees (*Apis mellifera* L.) are differentially affected by imidacloprid according to the season. *Pest Manag Sci* 59:269–278, 2003.

Directive 2004/10/EC of 11 February 2004 amending Council Directive 87/18/EEC, Official Journal of the European Union N° L 50: 44 – 59.

EFSA Guidance Document on the risk assessment of plant protection products on bees (*Apis mellifera*, *Bombus* spp. and solitary bees). EFSA Journal 11(7): 3295, 268 pp., 2014.

Guidance Document on Terrestrial Ecotoxicology Under Council Directive 91/414/EEC. SANCO/10329/2002 rev 2 final, 17 October 2002.

DP Barcode 451249

MRID 50784603

Ratte, M.: ToxRat Professional (2015), ToxRat Solutions GmbH, Naheweg 15, 52477 Alsdorf, Germany.

Regulation (EC) No 1107/2009 of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC. Official J. Eur. Union, L 309, 1 – 50.

Schneider-Orelli, O.: Entomologisches Praktikum. 1947. H.R. Sauerlander. Aarau. Switzerland. Translation: Entomological practical course. 1947. H.R. Sauerlander. Aarau. Switzerland.

Tänzler, V. and N. Knebel. 2017. Dicamba Technical: Chronic Oral Toxicity Test on the Honey Bee (*Apis mellifera* L.) in the Laboratory. Unpublished study performed by Ibacon GmbH. Submitted by Rotam Agrochemical Europe. Study ID 115831136. MRID 50931304.

All other references are standard guidance or methodologies

CETIS Summary Report

Report Date: 24 May-19 19:08 (p 1 of 2)
 Test Code/ID: 50784603 dd / 04-0002-4113

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study					BioChem Agrar
Batch ID:	16-6852-7147	Test Type:	2014 Honeybee Adult Chron Oral	Analyst:	
Start Date:	12 Jul-18	Protocol:	Honeybee Adult Chronic Oral Toxicity, 10-d	Diluent:	
Ending Date:	22 Jul-18	Species:	Apis mellifera	Brine:	
Test Length:	10d 0h	Taxon:		Source:	BioChem Agrar
Sample ID:	16-0065-5607	Code:	50784603 dd	Project:	Herbicide
Sample Date:	12 Jul-18	Material:	Dicamba	Source:	BASF SE
Receipt Date:		CAS (PC):	1918-00-9	Station:	
Sample Age:	n/a	Client:	CDM Smith		

029801 50784603 measured dd; Record created by: J. Burns
 Comments: The slope is not significantly different from zero, therefore confidence limits are unavailable.
 The Trimmed Spearman-Karber method is inappropriate because the trim required is greater than 50%.

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
19-6340-0490	10-Day Mortality Rate	Equal Variance t Two-Sample Test	0.2051	Solvent Blank passed 10-day mortality rate	1
14-6014-6429	Food Consumption	Equal Variance t Two-Sample Test	0.0136	Solvent Blank failed food consumption	1

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	TU	PMSD	S
19-5009-6178	10-Day Mortality Rate	Dunnett Multiple Comparison Test	<4.7	4.7	n/a		12.7%	1
08-6651-1016	10-Day Mortality Rate	Williams Multiple Comparison Test	60	>60	n/a		9.81%	1
05-3981-2324	Food Consumption	Dunnett Multiple Comparison Test	33	60	44.5		26.0%	1
03-1598-1411	Food Consumption	Williams Multiple Comparison Test	19	33	25.04		20.1%	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	µg/bee/da	95% LCL	95% UCL	TU	S
02-8726-8058	10-Day Mortality Rate	GLM: Log-Normal (Probit)	EC1	1140	n/a	n/a		1
			EC5	47.9	n/a	n/a		
			EC10	8.83	n/a	n/a		
			✓ EC15	2.82	n/a	n/a		
			✓ EC20	1.14	n/a	n/a		
			✓ EC25	0.523	n/a	n/a		
			✓ EC40	0.0738	n/a	n/a		
			✓ EC50	0.0227	n/a	n/a		
11-9149-9343	Food Consumption	NLR: 3P Cum Log-Normal (Probit)	✓ EC1	0.42	n/a	11.5		1
			✓ EC5	2.9	n/a	15.3		
			✓ EC10	8.13	0.392	25.7		
			EC15	16.3	4.9	37.1		
			EC20	28.3	11.9	56.2		
			EC25	45.5	16.6	102		
			EC40	150	15.2	957		
			EC50	308	12.9	7350		
16-4250-5291	Food Consumption	NLR: 3P Cum Log-Normal (Probit)	✓ EC1	0.42	n/a	11.5		1
			✓ EC5	2.9	n/a	15.3		
			✓ EC10	8.13	0.392	25.7		
			EC15	16.3	4.9	37.1		
			EC20	28.3	11.9	56.2		
			EC25	45.5	16.6	102		
			EC40	150	15.2	957		
			EC50	308	12.9	7350		

CETIS Summary Report

Report Date: 24 May-19 19:08 (p 2 of 2)
Test Code/ID: 50784603 dd / 04-0002-4113

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study**BioChem Agrar****10-Day Mortality Rate Summary**

Conc- μ g/bee/day	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	S	3	0.133	0.000	0.513	0.000	0.300	0.088	0.153	114.56%	0.00%
0	N	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-15.38%	
4.7		3	0.133	0.000	0.277	0.100	0.200	0.033	0.058	43.30%	0.00%
9.8		3	0.100	0.000	0.348	0.000	0.200	0.058	0.100	100.00%	-3.85%
19		3	0.067	0.000	0.210	0.000	0.100	0.033	0.058	86.60%	-7.69%
33		3	0.033	0.000	0.177	0.000	0.100	0.033	0.058	173.21%	-11.54%
60		3	0.067	0.000	0.210	0.000	0.100	0.033	0.058	86.60%	-7.69%

Food Consumption Summary

Conc- μ g/bee/day	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	S	3	26.3	22.6	29.9	25.1	27.9	0.841	1.46	5.55%	0.00%
0	N	3	36.9	26.6	47.2	32.5	40.7	2.39	4.14	11.21%	-40.61%
4.7		3	32	11.2	52.9	22.6	38.7	4.85	8.4	26.22%	-21.95%
9.8		3	33.3	26.7	39.9	30.2	34.9	1.53	2.66	7.99%	-26.65%
19		3	32.1	22.9	41.3	27.9	34.8	2.14	3.71	11.54%	-22.34%
33		3	28.2	17.9	38.6	25.3	33	2.4	4.16	14.75%	-7.49%
60		3	25.7	19.1	32.3	24	28.8	1.54	2.66	10.35%	2.03%

10-Day Mortality Rate Detail

Conc- μ g/bee/day	Code	Rep 1	Rep 2	Rep 3
0	S	0.000	0.100	0.300
0	N	0.000	0.000	0.000
4.7		0.100	0.100	0.200
9.8		0.100	0.200	0.000
19		0.100	0.000	0.100
33		0.100	0.000	0.000
60		0.100	0.100	0.000

Food Consumption Detail

Conc- μ g/bee/day	Code	Rep 1	Rep 2	Rep 3
0	S	25.1	27.9	25.8
0	N	40.7	32.5	37.6
4.7		22.6	34.8	38.7
9.8		34.7	30.2	34.9
19		34.8	27.9	33.7
33		33	26.4	25.3
60		24.4	28.8	24

CETIS Summary Report

Report Date: 24 May-19 19:11 (p 1 of 2)
 Test Code/ID: 50784603 dc / 18-3107-3810

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study					BioChem Agrar	
Batch ID:	07-9588-2886	Test Type:	2014 Honeybee Adult Chron Oral	Analyst:		
Start Date:	12 Jul-18	Protocol:	Honeybee Adult Chronic Oral Toxicity, 10-d	Diluent:		
Ending Date:	22 Jul-18	Species:	Apis mellifera	Brine:		
Test Length:	10d 0h	Taxon:		Source:	BioChem Agrar	Age:
Sample ID:	17-8739-6465	Code:	50784603 dc	Project:	Herbicide	
Sample Date:	12 Jul-18	Material:	Dicamba	Source:	BASF SE	
Receipt Date:	24 May-19 18:54	CAS (PC):	1918-00-9	Station:		
Sample Age:	n/a	Client:	CDM Smith			

029801 50784603 measured dc; Record created by J. Burns
 comments: The slope is not significantly different from zero, therefore confidence limits are unavailable.
 The Trimmed Spearman-Karber method is inappropriate because the trim required is greater than 50%.

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	TU	PMSD	S
00-7758-3032	10-Day Mortality Rate	Dunnett Multiple Comparison Test	✓ <149.1	149.1	n/a		12.7%	1
15-2094-2095	10-Day Mortality Rate	Williams Multiple Comparison Test	2358	>2358	n/a		9.81%	1
04-2575-2825	Food Consumption	Dunnett Multiple Comparison Test	1179	2358	1667		26.0%	1
05-3509-0923	Food Consumption	Williams Multiple Comparison Test	590	1179	834		20.1%	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	mg ai/kg	95% LCL	95% UCL	TU	S
02-6047-1871	10-Day Mortality Rate	GLM: Log-Normal (Probit)	EC5	1770	n/a	n/a		1
			EC10	276	n/a	n/a		
			✓ EC25	12.3	n/a	n/a		
			✓ EC50	0.391	n/a	n/a		
11-4503-6678	Food Consumption	NLR: 3P Cum Log-Normal (Probit)	✓ EC5	73.4	n/a	472		1
			✓ EC10	235	9.51	841		
			EC25	1640	550	3950		
			EC50	14200	509	394000		

10-Day Mortality Rate Summary

Conc-mg ai/kg	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	S	3	0.133	0.000	0.513	0.000	0.300	0.088	0.153	114.56%	0.00%
0	N	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000		-15.38%
149.1		3	0.133	0.000	0.277	0.100	0.200	0.033	0.058	43.30%	0.00%
295		3	0.100	0.000	0.348	0.000	0.200	0.058	0.100	100.00%	-3.85%
590		3	0.067	0.000	0.210	0.000	0.100	0.033	0.058	86.60%	-7.69%
1179		3	0.033	0.000	0.177	0.000	0.100	0.033	0.058	173.21%	-11.54%
2358		3	0.067	0.000	0.210	0.000	0.100	0.033	0.058	86.60%	-7.69%

Food Consumption Summary

Conc-mg ai/kg	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	S	3	26.3	22.6	29.9	25.1	27.9	0.841	1.46	5.55%	0.00%
0	N	3	36.9	26.6	47.2	32.5	40.7	2.39	4.14	11.21%	-40.61%
149.1		3	32	11.2	52.9	22.6	38.7	4.85	8.4	26.22%	-21.95%
295		3	33.3	26.7	39.9	30.2	34.9	1.53	2.66	7.99%	-26.65%
590		3	32.1	22.9	41.3	27.9	34.8	2.14	3.71	11.54%	-22.34%
1179		3	28.2	17.9	38.6	25.3	33	2.4	4.16	14.75%	-7.49%
2358		3	25.7	19.1	32.3	24	28.8	1.54	2.66	10.35%	2.03%

CETIS Summary ReportReport Date: 24 May-19 19:11 (p 2 of 2)
Test Code/ID: 50784603 dc / 18-3107-3810**Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study****BioChem Agrar****10-Day Mortality Rate Detail**

Conc-mg ai/kg	Code	Rep 1	Rep 2	Rep 3
0	S	0.000	0.100	0.300
0	N	0.000	0.000	0.000
149.1		0.100	0.100	0.200
295		0.100	0.200	0.000
590		0.100	0.000	0.100
1179		0.100	0.000	0.000
2358		0.100	0.100	0.000

Food Consumption Detail

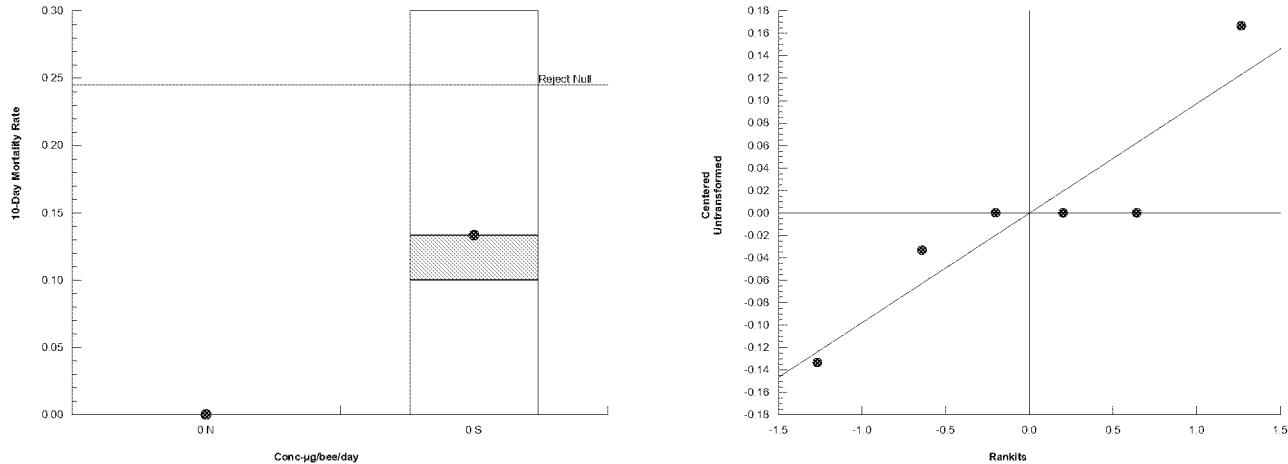
Conc-mg ai/kg	Code	Rep 1	Rep 2	Rep 3
0	S	25.1	27.9	25.8
0	N	40.7	32.5	37.6
149.1		22.6	34.8	38.7
295		34.7	30.2	34.9
590		34.8	27.9	33.7
1179		33	26.4	25.3
2358		24.4	28.8	24

CETIS Analytical Report

Report Date: 24 May-19 19:04 (p 1 of 6)
 Test Code/ID: 50784603 dd / 04-0002-4113

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study							BioChem Agrar				
Analysis ID: 19-6340-0490 Analyzed: 24 May-19 19:01		Endpoint: 10-Day Mortality Rate Analysis: Parametric-Two Sample			CETIS Version: CETISv1.9.5 Status Level: 1						
Batch ID: 16-6852-7147	Test Type: 2014 Honeybee Adult Chron Oral	Analyst:			Diluent:						
Start Date: 12 Jul-18	Protocol: Honeybee Adult Chronic Oral Toxicity, 10-d	Species: Apis mellifera	Taxon:	Brine:	Source: BioChem Agrar	Age:					
Test Length: 10d 0h											
Data Transform	Alt Hyp	Comparison Result			PMSD						
Untransformed	C <> T	Solvent Blank passed 10-day mortality rate			24.49%						
Equal Variance t Two-Sample Test											
Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α :5%)		
Negative Control	Solvent Blank		1.51	2.78	0.245	4	CDF	0.2051	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α :5%)					
Between	0.0266667	0.0266667	1	2.29	0.2051	Non-Significant Effect					
Error	0.0466667	0.0116667	4								
Total	0.0733333		5								
ANOVA Assumptions Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α :1%)					
Variance	Levene Equality of Variance Test		7.69	21.2	0.0502	Equal Variances					
	Mod Levene Equality of Variance Test		9	98.5	0.0955	Equal Variances					
Distribution	Shapiro-Wilk W Normality Test		0.877	0.43	0.2535	Normal Distribution					
10-Day Mortality Rate Summary											
Conc- μ g/bees/day	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	S	3	0.133	0.000	0.513	0.100	0.000	0.300	0.088	114.56%	0.00%
0	N	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000		-15.38%

Graphics



Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study					BioChem Agrar	
Analysis ID:	19-5009-6178	Endpoint:	10-Day Mortality Rate	CETIS Version:	CETISv1.9.5	
Analyzed:	24 May-19 19:02	Analysis:	Parametric-Control vs Treatments	Status Level:	1	
Batch ID:	16-6852-7147	Test Type:	2014 Honeybee Adult Chron Oral	Analyst:		
Start Date:	12 Jul-18	Protocol:	Honeybee Adult Chronic Oral Toxicity, 10-d	Diluent:		
Ending Date:	22 Jul-18	Species:	Apis mellifera	Brine:		
Test Length:	10d 0h	Taxon:		Source:	BioChem Agrar	
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C < T	<4.7	4.7	n/a		12.74%

Dunnett Multiple Comparison Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision($\alpha:5\%$)
Negative Control	4.7*		2.62	2.5	0.127	4	CDF	0.0410	Significant Effect
	9.8		1.96	2.5	0.127	4	CDF	0.1204	Non-Significant Effect
	19		1.31	2.5	0.127	4	CDF	0.3008	Non-Significant Effect
	33		0.655	2.5	0.127	4	CDF	0.5804	Non-Significant Effect
	60		1.31	2.5	0.127	4	CDF	0.3008	Non-Significant Effect

ANOVA Table

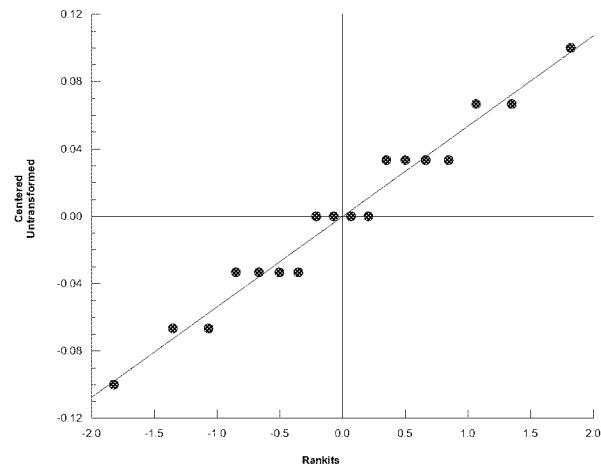
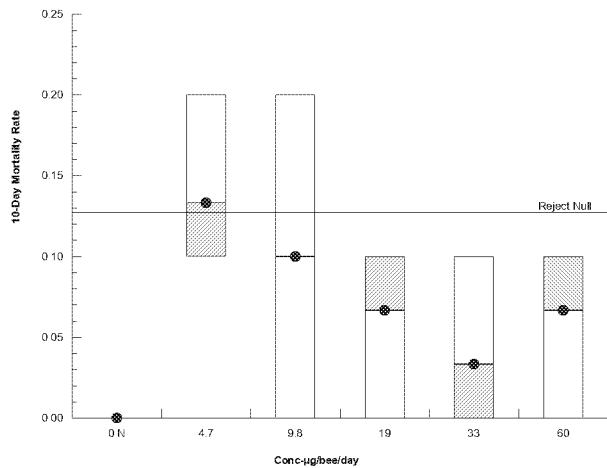
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision($\alpha:5\%$)
Between	0.0333333	0.0066667	5	1.71	0.2058	Non-Significant Effect
Error	0.0466667	0.0038889	12			
Total	0.08		17			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision($\alpha:1\%$)
Variance	Levene Equality of Variance Test	1.78	5.06	0.1905	Equal Variances
	Mod Levene Equality of Variance Test	0.6	8.75	0.7042	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.97	0.855	0.7974	Normal Distribution

10-Day Mortality Rate Summary

Conc- $\mu\text{g}/\text{bee/day}$	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00%
4.7		3	0.133	0.000	0.277	0.100	0.100	0.200	0.033	43.30%	13.33%
9.8		3	0.100	0.000	0.348	0.100	0.000	0.200	0.058	100.00%	10.00%
19		3	0.067	0.000	0.210	0.100	0.000	0.100	0.033	86.60%	6.67%
33		3	0.033	0.000	0.177	0.000	0.000	0.100	0.033	173.21%	3.33%
60		3	0.067	0.000	0.210	0.100	0.000	0.100	0.033	86.60%	6.67%

Graphics

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study					BioChem Agrar	
Analysis ID:	08-6651-1016	Endpoint:	10-Day Mortality Rate	CETIS Version:	CETISv1.9.5	
Analyzed:	24 May-19 19:02	Analysis:	Parametric-Control vs Ord.Treatments	Status Level:	1	
Batch ID:	16-6852-7147	Test Type:	2014 Honeybee Adult Chron Oral	Analyst:		
Start Date:	12 Jul-18	Protocol:	Honeybee Adult Chronic Oral Toxicity, 10-d	Diluent:		
Ending Date:	22 Jul-18	Species:	Apis mellifera	Brine:		
Test Length:	10d 0h	Taxon:		Source:	BioChem Agrar	
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C < T	60	>60	n/a		9.81%

Williams Multiple Comparison Test

Control	vs	Conc- $\mu\text{g}/\text{bee}/\text{day}$	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision($\alpha:5\%$)
Negative Control	4.7	2.62	1.78	0.091	4	CDF	>0.05	Non-Significant Effect	
	9.8	2.29	1.87	0.095	4	CDF	>0.05		
	19	1.96	1.9	0.097	4	CDF	>0.05		
	33	1.64	1.92	0.098	4	CDF	>0.05		
	60	1.57	1.93	0.098	4	CDF	>0.05		

ANOVA Table

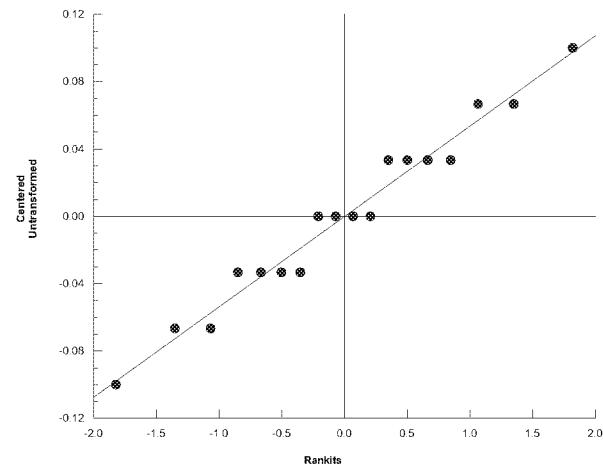
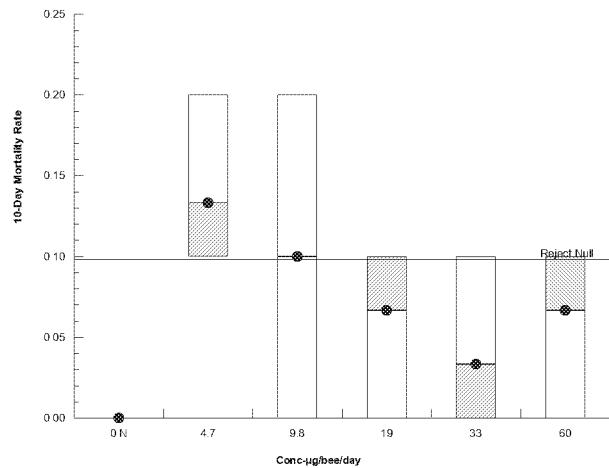
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision($\alpha:5\%$)
Between	0.0333333	0.0066667	5	1.71	0.2058	Non-Significant Effect
Error	0.0466667	0.0038889	12			
Total	0.08		17			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision($\alpha:1\%$)
Variance	Levene Equality of Variance Test	1.78	5.06	0.1905	Equal Variances
	Mod Levene Equality of Variance Test	0.6	8.75	0.7042	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.97	0.855	0.7974	Normal Distribution

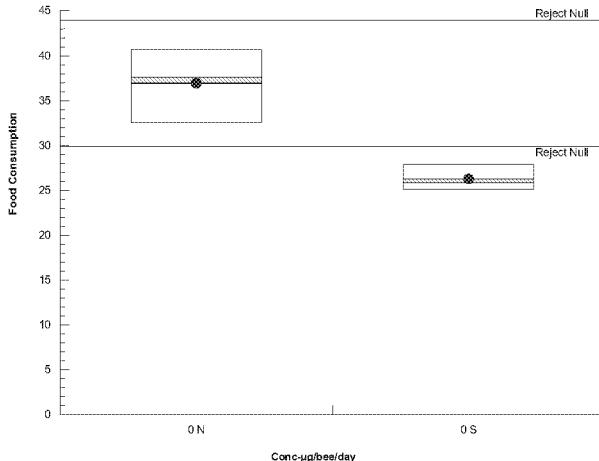
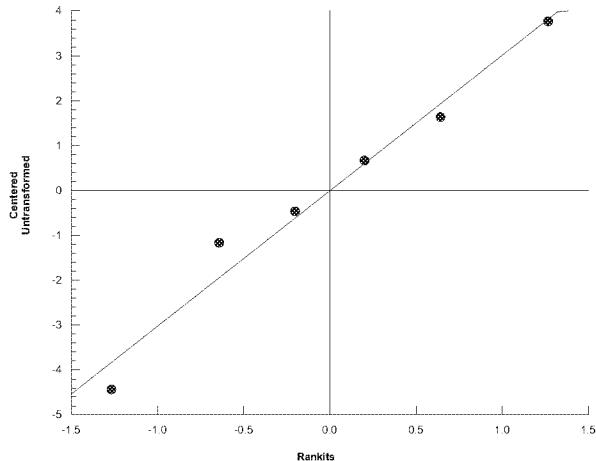
10-Day Mortality Rate Summary

Conc- $\mu\text{g}/\text{bee}/\text{day}$	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00%
4.7		3	0.133	0.000	0.277	0.100	0.100	0.200	0.033	43.30%	13.33%
9.8		3	0.100	0.000	0.348	0.100	0.000	0.200	0.058	100.00%	10.00%
19		3	0.067	0.000	0.210	0.100	0.000	0.100	0.033	86.60%	6.67%
33		3	0.033	0.000	0.177	0.000	0.000	0.100	0.033	173.21%	3.33%
60		3	0.067	0.000	0.210	0.100	0.000	0.100	0.033	86.60%	6.67%

Graphics

CETIS Analytical Report

Report Date: 24 May-19 19:04 (p 4 of 6)
 Test Code/ID: 50784603 dd / 04-0002-4113

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study							BioChem Agrar	
Analysis ID: 14-6014-6429 Analyzed: 24 May-19 19:02	Endpoint: Food Consumption Analysis: Parametric-Two Sample			CETIS Version: CETISv1.9.5 Status Level: 1				
Batch ID: 16-6852-7147 Start Date: 12 Jul-18 Ending Date: 22 Jul-18 Test Length: 10d 0h	Test Type: 2014 Honeybee Adult Chron Oral Protocol: Honeybee Adult Chronic Oral Toxicity, 10-d Species: Apis mellifera Taxon:			Analyst: Diluent: Brine: Source: BioChem Agrar Age:				
Data Transform	Alt Hyp			Comparison Result			PMSD	
Untransformed	C <> T			Solvent Blank failed food consumption			19.05%	
Equal Variance t Two-Sample Test								
Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value
Negative Control	Solvent Blank*		4.21	2.78	7.04	4	CDF	0.0136
ANOVA Table								
Source	Sum Squares		Mean Square		DF	F Stat		P-Value
Between	170.667		170.667		1	17.7		0.0136
Error	38.5333		9.63333		4			
Total	209.2				5			
ANOVA Assumptions Tests								
Attribute	Test			Test Stat	Critical	P-Value	Decision(α :5%)	
Variance	Variance Ratio F Test			8.07	199	0.2204	Equal Variances	
Distribution	Shapiro-Wilk W Normality Test			0.984	0.43	0.9705	Normal Distribution	
Food Consumption Summary								
Conc- μ g/bee/day	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max
0	S	3	26.3	22.6	29.9	25.8	25.1	27.9
0	N	3	36.9	26.6	47.2	37.6	32.5	40.7
Graphics								
								

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study					BioChem Agrar		
Analysis ID:	05-3981-2324	Endpoint:	Food Consumption	CETIS Version:	CETISv1.9.5		
Analyzed:	24 May-19 19:02	Analysis:	Parametric-Control vs Treatments	Status Level:	1		
Batch ID:	16-6852-7147	Test Type:	2014 Honeybee Adult Chron Oral	Analyst:			
Start Date:	12 Jul-18	Protocol:	Honeybee Adult Chronic Oral Toxicity, 10-d	Diluent:			
Ending Date:	22 Jul-18	Species:	Apis mellifera	Brine:			
Test Length:	10d 0h	Taxon:		Source:	BioChem Agrar		
Age:							
Data Transform	Alt Hyp		NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T		33	60	44.5		26.04%

Dunnett Multiple Comparison Test

Control	vs	Conc- $\mu\text{g}/\text{bee}/\text{day}$	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision($\alpha:5\%$)
Negative Control	4.7	1.27	2.5	9.62	4	CDF	0.3136	Non-Significant Effect	
	9.8	0.954	2.5	9.62	4	CDF	0.4458	Non-Significant Effect	
	19	1.25	2.5	9.62	4	CDF	0.3235	Non-Significant Effect	
	33	2.26	2.5	9.62	4	CDF	0.0745	Non-Significant Effect	
	60*	2.91	2.5	9.62	4	CDF	0.0245	Significant Effect	

ANOVA Table

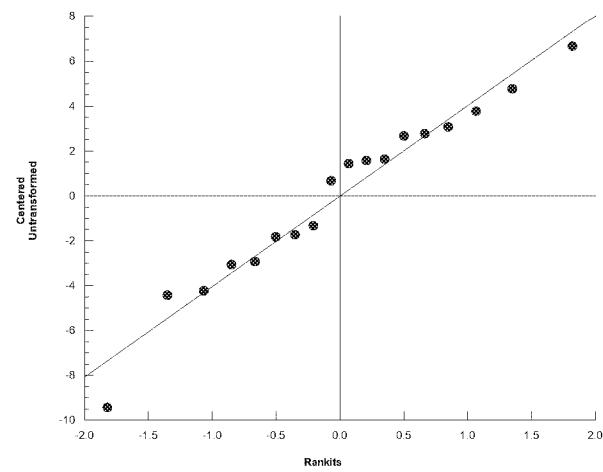
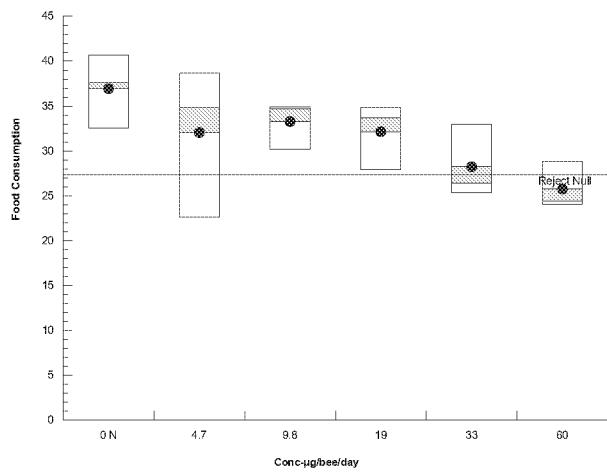
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision($\alpha:5\%$)
Between	231.538	46.3076	5	2.09	0.1371	Non-Significant Effect
Error	265.86	22.155	12			
Total	497.398		17			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision($\alpha:1\%$)
Variance	Bartlett Equality of Variance Test	3.52	15.1	0.6202	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.966	0.855	0.7188	Normal Distribution

Food Consumption Summary

Conc- $\mu\text{g}/\text{bee}/\text{day}$	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	36.9	26.6	47.2	37.6	32.5	40.7	2.39	11.21%	0.00%
4.7		3	32	11.2	52.9	34.8	22.6	38.7	4.85	26.22%	13.27%
9.8		3	33.3	26.7	39.9	34.7	30.2	34.9	1.53	7.99%	9.93%
19		3	32.1	22.9	41.3	33.7	27.9	34.8	2.14	11.54%	13.00%
33		3	28.2	17.9	38.6	26.4	25.3	33	2.4	14.75%	23.56%
60		3	25.7	19.1	32.3	24.4	24	28.8	1.54	10.35%	30.32%

Graphics

CETIS Analytical Report

Report Date: 24 May-19 19:04 (p 6 of 6)
 Test Code/ID: 50784603 dd / 04-0002-4113

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study					BioChem Agrar	
Analysis ID:	03-1598-1411	Endpoint:	Food Consumption	CETIS Version:	CETISv1.9.5	
Analyzed:	24 May-19 19:02	Analysis:	Parametric-Control vs Ord.Treatments	Status Level:	1	
Batch ID:	16-6852-7147	Test Type:	2014 Honeybee Adult Chron Oral	Analyst:		
Start Date:	12 Jul-18	Protocol:	Honeybee Adult Chronic Oral Toxicity, 10-d	Diluent:		
Ending Date:	22 Jul-18	Species:	Apis mellifera	Brine:		
Test Length:	10d 0h	Taxon:		Source:	BioChem Agrar	
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	19	33	25.04		20.05%

Williams Multiple Comparison Test

Control	vs	Conc- $\mu\text{g}/\text{bee}/\text{day}$	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision($\alpha:5\%$)
Negative Control	4.7	1.27	1.78	6.85	4	CDF	>0.05	Non-Significant Effect	
	9.8	1.11	1.87	7.2	4	CDF	>0.05	Non-Significant Effect	
	19	1.25	1.9	7.31	4	CDF	>0.05	Non-Significant Effect	
	33*	2.26	1.92	7.37	4	CDF	<0.05	Significant Effect	
	60*	2.91	1.93	7.41	4	CDF	<0.05	Significant Effect	

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision($\alpha:5\%$)
Between	231.538	46.3076	5	2.09	0.1371	Non-Significant Effect
Error	265.86	22.155	12			
Total	497.398		17			

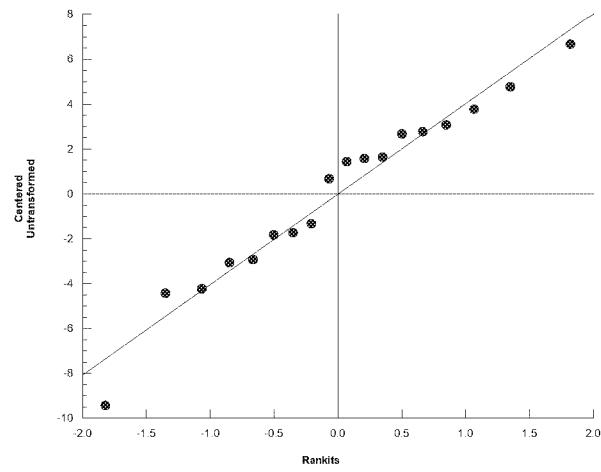
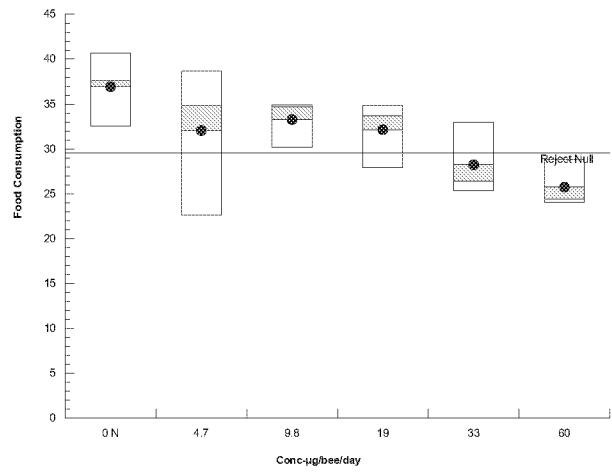
ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision($\alpha:1\%$)
Variance	Bartlett Equality of Variance Test	3.52	15.1	0.6202	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.966	0.855	0.7188	Normal Distribution

Food Consumption Summary

Conc- $\mu\text{g}/\text{bee}/\text{day}$	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	36.9	26.6	47.2	37.6	32.5	40.7	2.39	11.21%	0.00%
4.7		3	32	11.2	52.9	34.8	22.6	38.7	4.85	26.22%	13.27%
9.8		3	33.3	26.7	39.9	34.7	30.2	34.9	1.53	7.99%	9.93%
19		3	32.1	22.9	41.3	33.7	27.9	34.8	2.14	11.54%	13.00%
33		3	28.2	17.9	38.6	26.4	25.3	33	2.4	14.75%	23.56%
60		3	25.7	19.1	32.3	24.4	24	28.8	1.54	10.35%	30.32%

Graphics



CETIS Analytical Report

Report Date: 24 May-19 19:04 (p 1 of 2)
Test Code/ID: 50784603 dd / 04-0002-4113

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study					BioChem Agrar
Analysis ID:	02-8726-8058	Endpoint:	10-Day Mortality Rate		CETIS Version: CETISv1.9.5
Analyzed:	24 May-19 19:02	Analysis:	Linear Regression (GLM)		Status Level: 1
Batch ID:	16-6852-7147	Test Type:	2014 Honeybee Adult Chron Oral		Analyst:
Start Date:	12 Jul-18	Protocol:	Honeybee Adult Chronic Oral Toxicity, 10-d		Diluent:
Ending Date:	22 Jul-18	Species:	Apis mellifera		Brine:
Test Length:	10d 0h	Taxon:			Source: BioChem Agrar Age:

Linear Regression Options

Model Name	Link Function	Threshold Option	Thresh	Optimize	Pooled	Het Corr	Weighted
Log-Normal (Probit)	$\eta = \text{inv} \Phi[\pi]$	Zero Threshold	0	No	No	No	Yes

Regression Summary

Iters	LL	AICc	BIC	Mu	Sigma	Adj R2	PMSE	F Stat	P-Value	Decision($\alpha:5\%$)
6	-14.9	34.9	35.3	-1.64	-2.02	0.896		0.36	0.7830	Non-Significant Lack of Fit

Point Estimates

Level	$\mu\text{g}/\text{bee}/\text{da}$	95% LCL	95% UCL
EC1	1140	n/a	n/a
EC5	47.9	n/a	n/a
EC10	8.83	n/a	n/a
EC15	2.82	n/a	n/a
EC20	1.14	n/a	n/a
EC25	0.523	n/a	n/a
EC40	0.0738	n/a	n/a
EC50	0.0227	n/a	n/a

Regression Parameters

Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision($\alpha:5\%$)
Intercept	-0.814	0.479	-1.75	0.126	-1.7	0.1135	Non-Significant Parameter
Slope	-0.495	0.391	-1.26	0.271	-1.27	0.2278	Non-Significant Parameter

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision($\alpha:5\%$)
Model	69.1	69.1	1	122	<1.0E-37	Significant
Lack of Fit	0.717	0.239	3	0.36	0.7831	Non-Significant
Pure Error	6.63	0.663	10			
Residual	7.35	0.565	13			

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision($\alpha:5\%$)
Model Fit	Likelihood Ratio GOF Test	9.93	22.4	0.6993	Non-Significant Heterogeneity
	Pearson Chi-Sq GOF Test	7.35	22.4	0.8834	Non-Significant Heterogeneity
Variance	Bartlett Equality of Variance Test	0.808	9.49	0.9373	Equal Variances
	Mod Levene Equality of Variance	0.155	5.19	0.9525	Equal Variances
Distribution	Anderson-Darling A2 Normality Test	0.502	2.49	0.2107	Normal Distribution
	Shapiro-Wilk W Normality Test	0.924	0.882	0.2184	Normal Distribution
Overdispersion	Tarone C(α) Overdispersion	1.04	1.64	0.1485	Non-Significant Overdispersion

10-Day Mortality Rate Summary**Calculated Variate(A/B)**

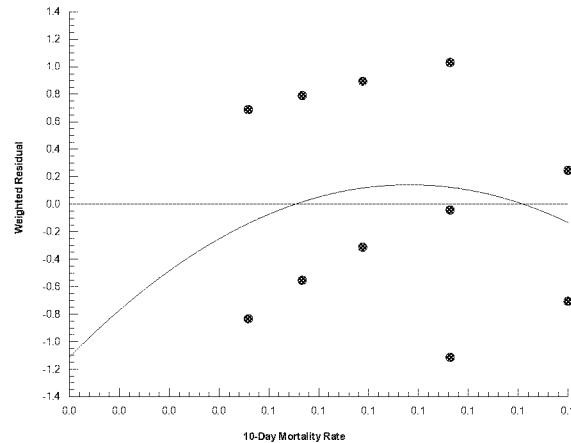
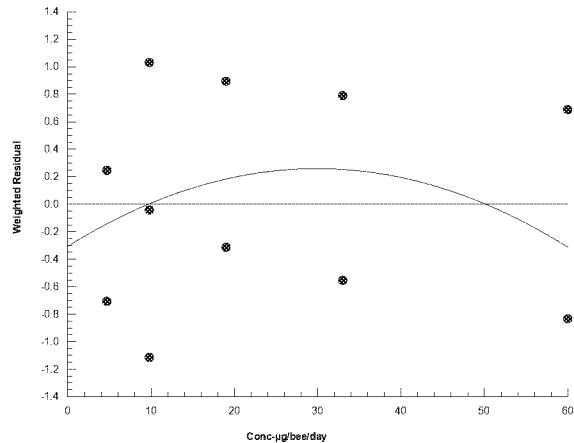
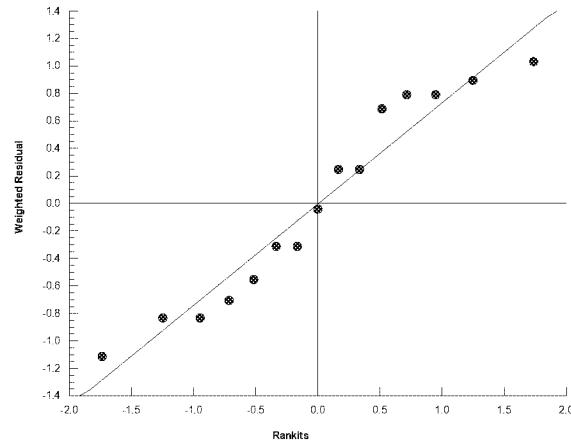
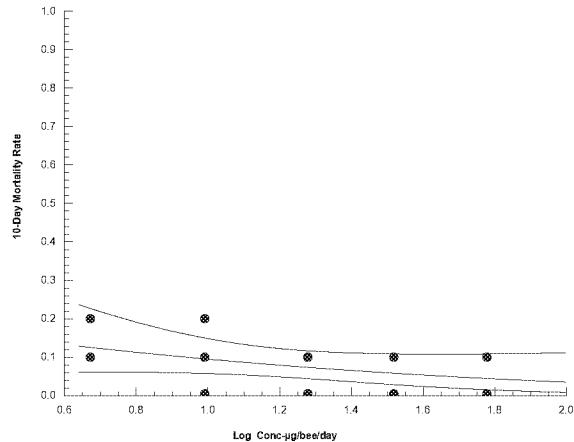
Conc- $\mu\text{g}/\text{bee}/\text{day}$	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
4.7		3	0.133	0.100	0.200	0.033	0.058	43.30%	0.0%	4	30
9.8		3	0.100	0.000	0.200	0.058	0.100	100.00%	-3.85%	3	30
19		3	0.067	0.000	0.100	0.033	0.058	86.60%	-7.69%	2	30
33		3	0.033	0.000	0.100	0.033	0.058	173.00%	-11.5%	1	30
60		3	0.067	0.000	0.100	0.033	0.058	86.60%	-7.69%	2	30

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study

BioChem Agrar

Analysis ID: 02-8726-8058
Analyzed: 24 May-19 19:02Endpoint: 10-Day Mortality Rate
Analysis: Linear Regression (GLM)CETIS Version: CETISv1.9.5
Status Level: 1

Graphics

Log-Normal: $\text{inv } \Phi[\pi] = \alpha + \beta \cdot \log[x]$ 

CETIS Analytical Report

Report Date: 24 May-19 19:05 (p 1 of 4)
 Test Code/ID: 50784603 dd / 04-0002-4113

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study					BioChem Agrar
Analysis ID: 11-9149-9343	Endpoint: Food Consumption			CETIS Version: CETISv1.9.5	
Analyzed: 24 May-19 19:02	Analysis: Nonlinear Regression (NLR)			Status Level: 1	
Batch ID: 16-6852-7147	Test Type: 2014 Honeybee Adult Chron Oral			Analyst:	
Start Date: 12 Jul-18	Protocol: Honeybee Adult Chronic Oral Toxicity, 10-d			Diluent:	
Ending Date: 22 Jul-18	Species: Apis mellifera			Brine:	
Test Length: 10d 0h	Taxon:			Source: BioChem Agrar	Age:

Non-Linear Regression Options

Model Name and Function	Weighting Function	PTBS Function	X Trans	Y Trans
3P Cum Log-Normal (Probit): $\mu = \alpha \cdot [1 - \Phi[\log[x/\delta]/\gamma]]$	Normal [$\omega=1$]	Off [$\mu^*=\mu$]	None	None

Regression Summary

Iters	Log LL	AICc	BIC	Adj R2	PMSE	Thresh	Optimize	F Stat	P-Value	Decision($\alpha:5\%$)
11	-25.5	58.7	59.6	0.3433	14.54%	36.5	Yes	0.336	0.7997	Non-Significant Lack of Fit

Point Estimates

Level	$\mu\text{g}/\text{bee}/\text{da}$	95% LCL	95% UCL
EC1	0.42	n/a	11.5
EC5	2.9	n/a	15.3
EC10	8.13	0.392	25.7
EC15	16.3	4.9	37.1
EC20	28.3	11.9	56.2
EC25	45.5	16.6	102
EC40	150	15.2	957
EC50	308	12.9	7350

Regression Parameters

Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision($\alpha:5\%$)
α	36.5	2.49	31.2	41.8	14.7	<1.0E-37	Significant Parameter
γ	2.84	1.59	-0.563	6.23	1.78	0.0956	Non-Significant Parameter
δ	308	362	-464	1080	0.85	0.4087	Non-Significant Parameter

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision($\alpha:5\%$)
Model	17900	5980	3	311	<1.0E-37	Significant
Lack of Fit	22.3	7.44	3	0.336	0.7997	Non-Significant
Pure Error	266	22.2	12			
Residual	288	19.2	15			

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision($\alpha:5\%$)
Variance	Mod Levene Equality of Variance	0.662	4.39	0.6665	Equal Variances
Distribution	Anderson-Darling A2 Normality Test	0.755	2.49	0.0491	Non-Normal Distribution
	Shapiro-Wilk W Normality Test	0.882	0.897	0.0280	Non-Normal Distribution

Food Consumption Summary

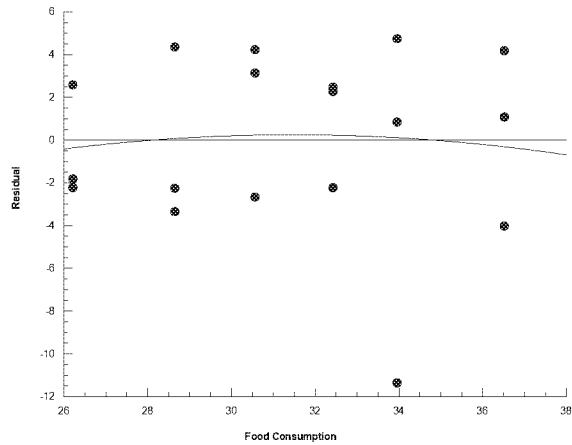
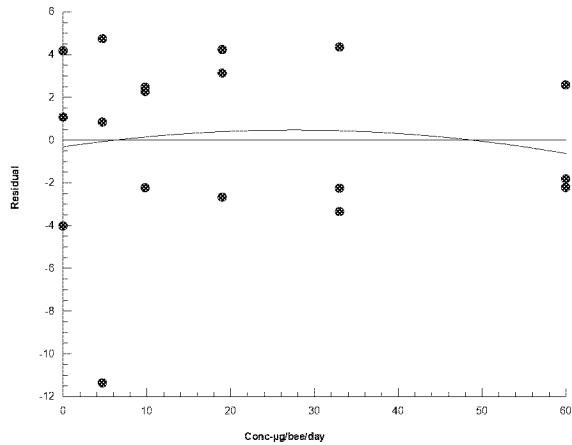
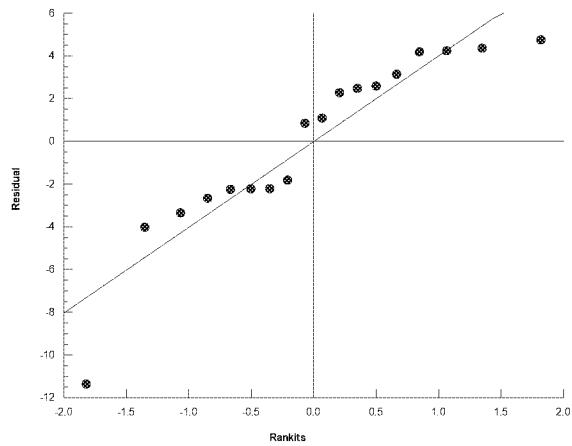
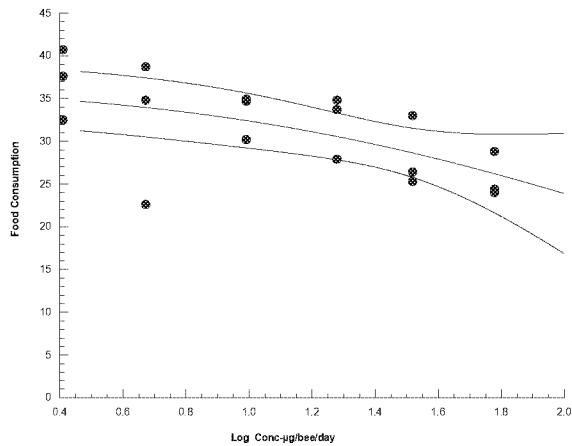
Conc- $\mu\text{g}/\text{bee}/\text{day}$	Code	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	3	36.9	32.5	40.7	2.39	4.14	11.20%	0.0%
4.7		3	32	22.6	38.7	4.85	8.4	26.20%	13.3%
9.8		3	33.3	30.2	34.9	1.53	2.66	7.99%	9.93%
19		3	32.1	27.9	34.8	2.14	3.71	11.50%	13.0%
33		3	28.2	25.3	33	2.4	4.16	14.80%	23.6%
60		3	25.7	24	28.8	1.54	2.66	10.30%	30.3%

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study

BioChem Agrar

Analysis ID: 11-9149-9343
Analyzed: 24 May-19 19:02Endpoint: Food Consumption
Analysis: Nonlinear Regression (NLR)CETIS Version: CETISv1.9.5
Status Level: 1

Graphics

Model: 3P Cum Log-Normal (Probit): $\mu = \alpha \cdot [1 - \Phi[\log[x/\delta]/\gamma]]$ Distribution: Normal [$\omega=1$]

CETIS Analytical Report

Report Date: 24 May-19 19:05 (p 3 of 4)
 Test Code/ID: 50784603 dd / 04-0002-4113

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study					BioChem Agrar
Analysis ID:	16-4250-5291	Endpoint:	Food Consumption		CETIS Version: CETISv1.9.5
Analyzed:	24 May-19 19:03	Analysis:	Nonlinear Regression (NLR)		Status Level: 1
Batch ID:	16-6852-7147	Test Type:	2014 Honeybee Adult Chron Oral		Analyst:
Start Date:	12 Jul-18	Protocol:	Honeybee Adult Chronic Oral Toxicity, 10-d		Diluent:
Ending Date:	22 Jul-18	Species:	Apis mellifera		Brine:
Test Length:	10d 0h	Taxon:			Source: BioChem Agrar Age:

Non-Linear Regression Options

Model Name and Function	Weighting Function	PTBS Function	X Trans	Y Trans
3P Cum Log-Normal (Probit): $\mu = \alpha \cdot [1 - \Phi[\log[x/\delta]/\gamma]]$	Normal [$\omega=1$]	Off [$\mu^*=\mu$]	None	None

Regression Summary

Iters	Log LL	AICc	BIC	Adj R2	PMSE	Thresh	Optimize	F Stat	P-Value	Decision($\alpha:5\%$)
11	-25.5	58.7	59.6	0.3433	14.54%	36.5	Yes	0.336	0.7997	Non-Significant Lack of Fit

Point Estimates

Level	μ g/bee/da	95% LCL	95% UCL
EC1	0.42	n/a	11.5
EC5	2.9	n/a	15.3
EC10	8.13	0.392	25.7
EC15	16.3	4.9	37.1
EC20	28.3	11.9	56.2
EC25	45.5	16.6	102
EC40	150	15.2	957
EC50	308	12.9	7350

Regression Parameters

Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision($\alpha:5\%$)
α	36.5	2.49	31.2	41.8	14.7	<1.0E-37	Significant Parameter
γ	2.84	1.59	-0.563	6.23	1.78	0.0956	Non-Significant Parameter
δ	308	362	-464	1080	0.85	0.4087	Non-Significant Parameter

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision($\alpha:5\%$)
Model	17900	5980	3	311	<1.0E-37	Significant
Lack of Fit	22.3	7.44	3	0.336	0.7997	Non-Significant
Pure Error	266	22.2	12			
Residual	288	19.2	15			

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision($\alpha:5\%$)
Variance	Mod Levene Equality of Variance	0.662	4.39	0.6665	Equal Variances
Distribution	Anderson-Darling A2 Normality Test	0.755	2.49	0.0491	Non-Normal Distribution
	Shapiro-Wilk W Normality Test	0.882	0.897	0.0280	Non-Normal Distribution

Food Consumption Summary

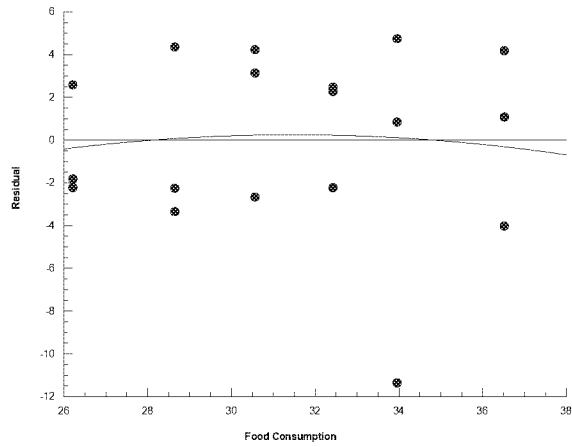
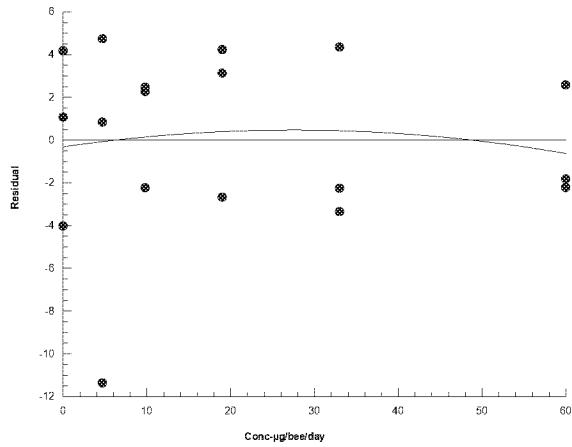
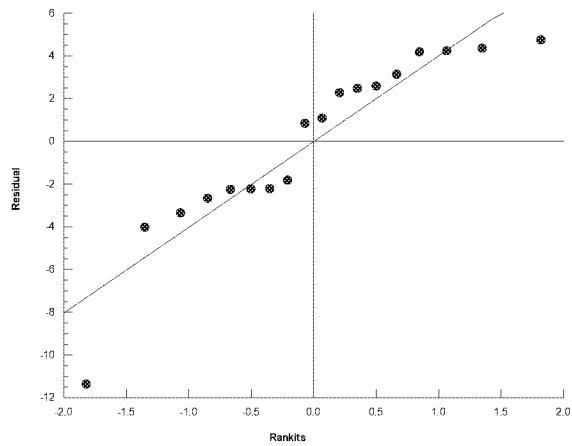
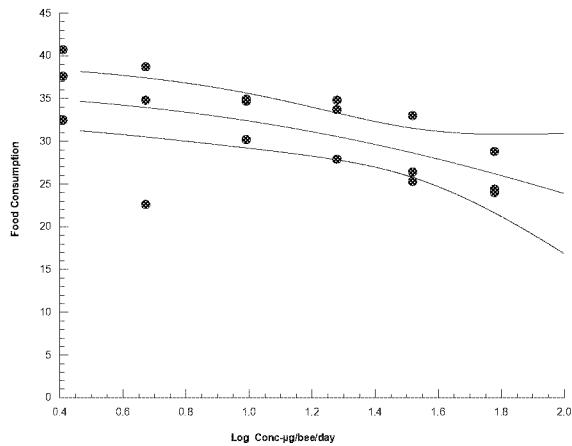
Conc- μ g/bee/day	Code	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	3	36.9	32.5	40.7	2.39	4.14	11.20%	0.0%
4.7		3	32	22.6	38.7	4.85	8.4	26.20%	13.3%
9.8		3	33.3	30.2	34.9	1.53	2.66	7.99%	9.93%
19		3	32.1	27.9	34.8	2.14	3.71	11.50%	13.0%
33		3	28.2	25.3	33	2.4	4.16	14.80%	23.6%
60		3	25.7	24	28.8	1.54	2.66	10.30%	30.3%

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study

BioChem Agrar

Analysis ID: 16-4250-5291
Analyzed: 24 May-19 19:03Endpoint: Food Consumption
Analysis: Nonlinear Regression (NLR)CETIS Version: CETISv1.9.5
Status Level: 1

Graphics

Model: 3P Cum Log-Normal (Probit): $\mu = \alpha \cdot [1 - \Phi[\log[x/\delta]/\gamma]]$ Distribution: Normal [$\omega=1$]

CETIS Analytical Report

Report Date: 24 May-19 19:10 (p 1 of 2)
 Test Code/ID: 50784603 dc / 18-3107-3810

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study					BioChem Agrar
Analysis ID:	02-6047-1871	Endpoint:	10-Day Mortality Rate		CETIS Version: CETISv1.9.5
Analyzed:	24 May-19 18:58	Analysis:	Linear Regression (GLM)		Status Level: 1
Batch ID:	07-9588-2886	Test Type:	2014 Honeybee Adult Chron Oral		Analyst:
Start Date:	12 Jul-18	Protocol:	Honeybee Adult Chronic Oral Toxicity, 10-d		Diluent:
Ending Date:	22 Jul-18	Species:	Apis mellifera		Brine:
Test Length:	10d 0h	Taxon:			Source: BioChem Agrar Age:

Linear Regression Options

Model Name	Link Function	Threshold Option	Thresh	Optimize	Pooled	Het Corr	Weighted
Log-Normal (Probit)	$\eta = \text{inv} \Phi[\pi]$	Zero Threshold	0	No	No	No	Yes

Regression Summary

Iters	LL	AICc	BIC	Mu	Sigma	Adj R2	PMSE	F Stat	P-Value	Decision($\alpha:5\%$)
6	-15	34.9	35.4	-0.408	-2.22	0.898		0.389	0.7640	Non-Significant Lack of Fit

Point Estimates

Level	mg ai/kg	95% LCL	95% UCL
EC5	1770	n/a	n/a
EC10	276	n/a	n/a
EC25	12.3	n/a	n/a
EC50	0.391	n/a	n/a

Regression Parameters

Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision($\alpha:5\%$)
Intercept	-0.184	0.984	-2.11	1.75	-0.187	0.8549	Non-Significant Parameter
Slope	-0.45	0.363	-1.16	0.261	-1.24	0.2368	Non-Significant Parameter

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision($\alpha:5\%$)
Model	70.2	70.2	1	124	<1.0E-37	Significant
Lack of Fit	0.77	0.257	3	0.389	0.7637	Non-Significant
Pure Error	6.61	0.661	10			
Residual	7.38	0.568	13			

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision($\alpha:5\%$)
Model Fit	Likelihood Ratio GOF Test	9.98	22.4	0.6953	Non-Significant Heterogeneity
	Pearson Chi-Sq GOF Test	7.38	22.4	0.8816	Non-Significant Heterogeneity
Variance	Bartlett Equality of Variance Test	0.788	9.49	0.9400	Equal Variances
	Mod Levene Equality of Variance	0.15	5.19	0.9549	Equal Variances
Distribution	Anderson-Darling A2 Normality Test	0.487	2.49	0.2291	Normal Distribution
	Shapiro-Wilk W Normality Test	0.923	0.882	0.2170	Normal Distribution
Overdispersion	Tarone C(α) Binomial Overdispersion	1.04	1.64	0.1485	Non-Significant Overdispersion

10-Day Mortality Rate Summary

Calculated Variate(A/B)

Conc-mg ai/kg	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
149.1		3	0.133	0.100	0.200	0.033	0.058	43.30%	0.0%	4	30
295		3	0.100	0.000	0.200	0.058	0.100	100.00%	-3.85%	3	30
590		3	0.067	0.000	0.100	0.033	0.058	86.60%	-7.69%	2	30
1179		3	0.033	0.000	0.100	0.033	0.058	173.00%	-11.5%	1	30
2358		3	0.067	0.000	0.100	0.033	0.058	86.60%	-7.69%	2	30

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study

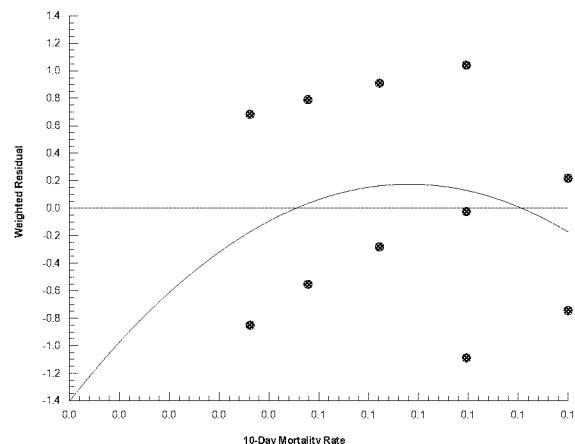
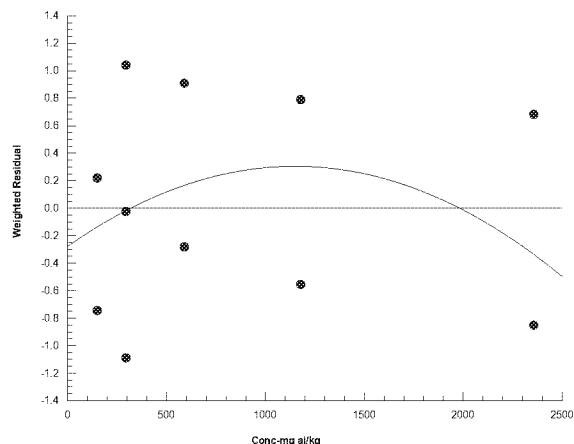
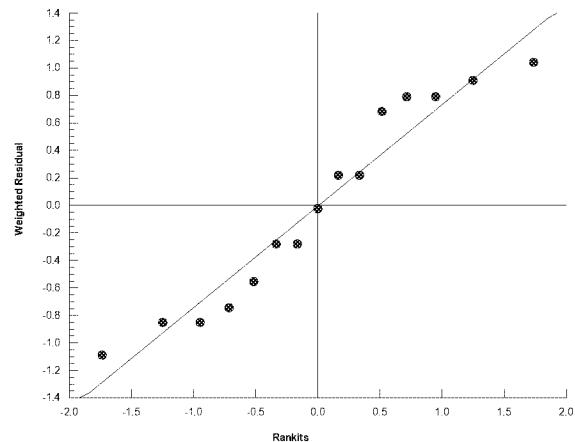
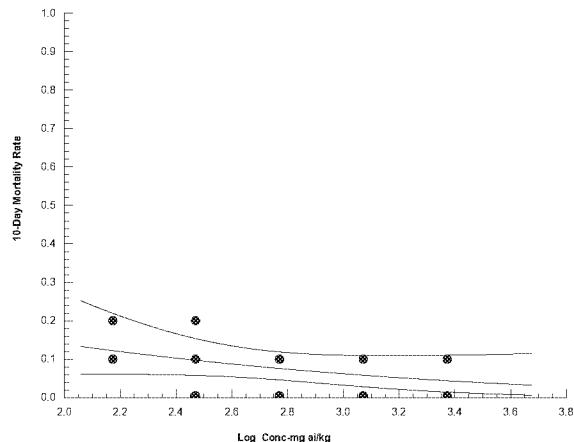
BioChem Agrar

Analysis ID: 02-6047-1871
 Analyzed: 24 May-19 18:58

Endpoint: 10-Day Mortality Rate
 Analysis: Linear Regression (GLM)

CETIS Version: CETISv1.9.5
 Status Level: 1

Graphics

Log-Normal: $\text{inv } \Phi[\pi] = \alpha + \beta \cdot \log[x]$ 

CETIS Analytical Report

Report Date: 24 May-19 19:10 (p 1 of 2)
 Test Code/ID: 50784603 dc / 18-3107-3810

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study					BioChem Agrar
Analysis ID:	11-4503-6678	Endpoint:	Food Consumption		CETIS Version: CETISv1.9.5
Analyzed:	24 May-19 18:59	Analysis:	Nonlinear Regression (NLR)		Status Level: 1
Batch ID:	07-9588-2886	Test Type:	2014 Honeybee Adult Chron Oral		Analyst:
Start Date:	12 Jul-18	Protocol:	Honeybee Adult Chronic Oral Toxicity, 10-d		Diluent:
Ending Date:	22 Jul-18	Species:	Apis mellifera		Brine:
Test Length:	10d 0h	Taxon:			Source: BioChem Agrar Age:

Non-Linear Regression Options

Model Name and Function	Weighting Function	PTBS Function	X Trans	Y Trans
3P Cum Log-Normal (Probit): $\mu = \alpha \cdot [1 - \Phi[\log[x/\delta]/\gamma]]$	Normal [$\omega=1$]	Off [$\mu^*=\mu$]	None	None

Regression Summary

Iters	Log LL	AICc	BIC	Adj R2	PMSD	Thresh	Optimize	F Stat	P-Value	Decision($\alpha:5\%$)
9	-25.3	58.4	59.3	0.3533	14.44%	36.6	Yes	0.27	0.8458	Non-Significant Lack of Fit

Point Estimates

Level	mg ai/kg	95% LCL	95% UCL
EC5	73.4	n/a	472
EC10	235	9.51	841
EC25	1640	550	3950
EC50	14200	509	394000

Regression Parameters

Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision($\alpha:5\%$)
α	36.6	2.48	31.3	41.9	14.8	<1.0E-37	Significant Parameter
γ	3.2	1.72	-0.472	6.87	1.86	0.0830	Non-Significant Parameter
δ	14200	17900	-24100	52400	0.789	0.4424	Non-Significant Parameter

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision($\alpha:5\%$)
Model	17900	5980	3	316	<1.0E-37	Significant
Lack of Fit	18	5.98	3	0.27	0.8458	Non-Significant
Pure Error	266	22.2	12			
Residual	284	18.9	15			

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision($\alpha:5\%$)
Variance	Mod Levene Equality of Variance	0.662	4.39	0.6665	Equal Variances
Distribution	Anderson-Darling A2 Normality Test	0.696	2.49	0.0691	Normal Distribution
	Shapiro-Wilk W Normality Test	0.892	0.897	0.0416	Non-Normal Distribution

Food Consumption Summary

Conc-mg ai/kg	Code	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	3	36.9	32.5	40.7	2.39	4.14	11.20%	0.0%
149.1		3	32	22.6	38.7	4.85	8.4	26.20%	13.3%
295		3	33.3	30.2	34.9	1.53	2.66	7.99%	9.93%
590		3	32.1	27.9	34.8	2.14	3.71	11.50%	13.0%
1179		3	28.2	25.3	33	2.4	4.16	14.80%	23.6%
2358		3	25.7	24	28.8	1.54	2.66	10.30%	30.3%

Special Study Honey bee Adult Chronic Oral Toxicity, 10-day Study

BioChem Agrar

Analysis ID: 11-4503-6678
Analyzed: 24 May-19 18:59Endpoint: Food Consumption
Analysis: Nonlinear Regression (NLR)CETIS Version: CETISv1.9.5
Status Level: 1

Graphics

Model: 3P Cum Log-Normal (Probit): $\mu = \alpha \cdot [1 - \Phi[\log[x/\delta]/\gamma]]$ Distribution: Normal [$\omega=1$]